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Wisconsin
Department of Commerce

SAFETY AND BUILDINGS DIVISION
Plumbing Product Review
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Jim Doyle, Governor
Richard J. Leinenkugel, Secretary

May 19, 2009

CULLIGAN INTERNATIONAL
ANNA K. LEVOY
9399 W HIGGINS RD SUITE 1100
ROSEMONT IL 60018

Re: Description: WATER TREATMENT DEVICE-REVERSE OSMOSIS
Manufacturer: CULLIGAN INTERNATIONAL
Product Name: AQUA-CLEER DRINKING WATER SYSTEMS (POU)
Model Number(s): RO 30 AND RO50 BOTH USING THE TD AND PER CARTRIDGES AND THE CB OR GAC CARTRIDGES (POU)
Product File No: 20090132

The specifications and/or plans for this plumbing product have been reviewed and determined to be in compliance with chapters Comm 82 through 84, Wisconsin Administrative Code, and Chapters 145 and 160, Wisconsin Statutes.

The Department hereby issues an approval based on the Wisconsin Statutes and the Wisconsin Administrative Code. This approval is valid until the end of May 2014.

This approval is contingent upon compliance with the following stipulation(s):

- This product has undergone sufficient testing to document the product's ability to reduce only those contaminants and/or substances as specified in this approval letter when the product is installed and maintained in strict accordance with the manufacturers published instructions.

- Where the Department of Natural Resources (DNR) has jurisdiction, a written approval may be required prior to installation of this product in a water supply system to reduce the concentration of a contaminant that exceeds the primary drinking water standards contained in ch. NR 809, Wis. Admin. Code, the enforcement standards contained in ch. NR 140, Wis. Admin. Code, or for a water supply system that is subject to a written advisory opinion by the DNR. For more information contact the DNR Section of Private Water Systems, P.O. Box 7921, Madison, WI 53707, telephone (608) 266-3415.

- If these approved devices are modified or additional assertions of function or performance are made, then this approval shall be considered null and void, unless the change is submitted to the department for review and the approval is reaffirmed.

- The system shall be provided with an in-line total dissolved solids (TDS) monitor, or other acceptable means, to warn the user when the system is not performing it's functions. Acceptable alternatives to an in-line TDS monitor include:

  1. terminating the discharge of treated water;

  2. sounding an alarm which is connected to acceptable power source;

  3. flashing a light connected to an acceptable power source;

  4. providing the user with an obvious, readily interpretable, indication of the system's ability to perform (e.g. decreasing the flow rate of treated water by 50% or more for systems making mechanical filtration claims;

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5. Providing a sampling service by the manufacturer, either directly or through an authorized dealer, a minimum of once every six months;

6. Providing a sampling kit for analysis of TDS or other appropriate contaminants; or

7. Providing a TDS monitor to measure the product water quality.

Whichever means of performance verification is selected, it shall be clearly described in the owner's manual for this device, and approved for use along with the device.

- These devices will only reduce the concentration of volatile organic chemicals at water outlets that are served by the devices. There are dermal (skin) absorption and inhalation exposure risks associated with volatile organic chemicals. Therefore, using point-of-use devices such as these will not protect all routes of potential exposure. Potentially hazardous exposures to volatile organic chemicals will remain possible at unprotected outlets, particularly hot water outlets (e.g. bathing, showering, clothes washing or dish washing).

  If, by way of reputable water analyses, a water supply is known to contain unsafe levels of volatile organic chemicals, then all the water entering the residence must be treated at the point-of-entry using an approved water treatment device to address all potential routes of exposure.

- These devices will only reduce the concentration of cysts/oocysts at water outlets that are served by the devices. Therefore, using point-of-use devices such as these will not protect all routes of potential exposure. Potentially hazardous exposures to cysts/oocysts will remain possible at unprotected outlets.

  The presence of cysts/oocysts strongly suggests that other pathogens (e.g. bacteria, virus) may also be present.

  If, by way of reputable water analyses, a water supply is known to contain cysts/oocysts, then all the water entering the residence must be treated at the point-of-entry, using an approved water treatment device, to address all potential routes of exposure thereby providing a biologically safe water supply.

- If the treatment components of this device (e.g. replacement cartridge) are replaced with anything other than those originally approved for use with this device, then this approval shall immediately be considered null and void.

Based on testing data submitted to and reviewed by the department, this approval recognizes that these plumbing products will reduce the concentration of contaminants as specified on pages 1 through 6 of this letter.

AESTHETIC CONTAMINANT REDUCTION CAPABILITIES
PRODUCT FILE NUMBER 20090132
TABLE 1 OF 4

Product Water Production Rate: RO30 = 136 liters per day (lpd) [36 gallons per day (gpd)]
RO50 = 189 lpd [50 gpd]

Capacity*: 3,785 liters (l) [1,000 gallons (gals.)]

Tested Contaminant	Influent Challenge (mg/l▲)[1]
Chlorine (free)*	2.0 ± 10%
Particulates (0.5 to < 1.0 µm)*	≥ 1.0×10^4 #/ml
Chloramines*	3.0 ± 10%
Total Dissolved Solids (NaCl)	750 ± 40

Other Conditions: the contaminant reduction performance capabilities displayed for Table 1 of 4 were verified by testing conducted in accordance with NSF *International* Standards 42 and 58. To qualify for free chlorine reduction, the device must reduce the influent challenge concentrations by ≥ 50%; meeting the free chlorine reduction requirements also qualifies the device for the reduction of aesthetic, organic, taste and odor reduction (e.g. geosmin, methylisoborneol); this does not include hydrogen sulfide. To qualify for particulate reduction, Class 1, the device must reduce the influent challenge concentrations by ≥ 85%. To qualify for chloramine reduction, the device must reduce the influent challenge concentrations such that all effluent concentrations are ≤ 0.5 mg/l. To qualify for total dissolved solids reduction, the device must reduce the influent challenge concentrations by ≥ 75%.

1 = milligrams per liter (mg/l) are equivalent to parts per million (ppm)
± = plus or minus
***** = based on the tested capabilities of the "Total Defense" (i.e. "TD") cartridge
≥ = greater than or equal to
< = less than
▲ = unless otherwise indicated

HEALTH EFFECTING INORGANIC CONTAMINANT REDUCTION CAPABILITIES
PRODUCT FILE NUMBER 20090132
TABLE 2 OF 4

Product Water Production Rate: RO30 = 136 liters per day (lpd) [36 gallons per day (gpd)]
RO50 = 189 lpd [50 gpd]

Capacity*: 3,785 liters (l) [1,000 gallons (gals.)]

Tested Contaminant	Tested Influent Concentration (mg/l*)[1]
Arsenic (As^{+5})	0.050 ± 10%
Barium (Ba^{+2})	10.0 ± 10%
Cadmium (Cd^{+2})	0.03 ± 10%
Copper (Cu^{+2})	3.0 ± 10%
Hexavalent Chromium (Cr^{+6})	0.15 ± 10%
Fluoride (F^-)	8.0 ± 10%
Lead* (Pb^{+2})	0.15 ± 10%
Mercury* (Hg^{+2})	0.006 ± 10%
Nitrate (NO_3^-)	27.0 ± 10%
Nitrite (NO_2^-)	3.0 ± 10%
Perchlorate* (ClO_4^-)	0.13 ± 25%
Radium 226/228 (*barium surrogate*)	25 pCi/L
Selenium (Se^{+4} and Se^{+6})	0.10 ± 10%
Trivalent chromium (Cr^{+3})	0.15 ± 10%

Other conditions: the contaminant reduction capabilities displayed for table 2 of 4 were generated by testing conducted in accordance with NSF/ANSI Standards 58 and/or 53. To qualify for arsenic reduction, the device must reduce the influent challenge concentrations such that all effluent concentrations are ≤ 0.010 mg/l.

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To qualify for barium reduction, the device must reduce the influent challenge water concentrations such that all effluent concentrations are ≤ 2.0 mg/l. To qualify for cadmium reduction, the device must reduce the influent challenge concentrations such that all effluent concentrations are ≤ 0.005 mg/l. To qualify for copper reduction, the device must reduce the influent challenge water concentrations such that all effluent concentrations are ≤ 1.3 mg/l. To qualify for chromium reduction (i.e. trivalent or hexavalent), the device must reduce the influent challenge concentrations such that all effluent concentrations are ≤ 0.1 mg/l. To qualify for fluoride reduction, the device must reduce the influent challenge concentrations such that all effluent concentrations are ≤ 1.5 mg/l. To qualify for lead reduction, the device must reduce the influent challenge concentrations such that all effluent concentrations are ≤ 0.010 mg/l; both the "TD" cartridge and the RO systems themselves (i.e. without the "TD" cartridge) are approved for lead reduction. To qualify for mercury reduction, the device must reduce the influent challenge concentrations such that all effluent concentrations are ≤ 0.002 mg/l; the mercury reduction claim is based entirely on testing of the "TD" cartridge. To qualify for nitrate/nitrite reduction, the device must reduce the influent challenge water concentrations, such that all effluent concentrations are ≤ 10.0 mg/l (as N), also, no more than 1.0 mg/l (as N) shall be in the form of nitrite. To qualify for perchlorate reduction, the device must reduce the influent challenge concentrations such that all effluent concentrations are < 0.004 mg/l. To qualify for radium reduction, the device must reduce the influent barium challenge concentrations such that all effluent concentrations are ≤ 2.0 mg/l (barium is used as a surrogate based on its relationship with radium on the periodic table and the difficulty in using radium for routine testing). To qualify for selenium reduction, the device must reduce the influent challenge concentrations such that all effluent concentrations are ≤ 0.05 mg/l.

1 = milligrams per liter (mg/l) are equivalent to parts per million (ppm)
± = plus or minus
***** = based on the tested capabilities of the "Perchlorate" (i.e. "PER") cartridge
≤ = less than or equal to

HEALTH EFFECTING BIOLOGICAL CONTAMINANT REDUCTION CAPABILITIES
PRODUCT FILE NUMBER 20090132
TABLE 3 OF 4

Product Water Production Rate: RO30 = 136 liters per day (lpd) [36 gallons per day (gpd)]
RO50 = 189 lpd [50 gpd]

Tested Contaminant*	Influent Challenge (#/ml)
Cysts/Oocysts[1]	≥ 5.0×10^4

Other Conditions: the contaminant reduction performance capabilities displayed for Table 3 of 4 were verified by testing conducted in accordance with NSF *International* Standards 58 and 53. To qualify for cyst/oocyst reduction, the device must reduce the influent challenge concentrations by ≥ 99.95% at each sample point.

1 = the specific organisms covered under this testing protocol include cryptosporidium parvum, entamoeba histolytica, giardia lamblia and toxoplasma gondii
#/ml = particles per milliliter
≥ = greater than or equal to
***** = based on the tested capabilities of the "Total Defense" (i.e. "TD") cartridge and the RO systems proper (i.e. without the "TD" cartridge)

HEALTH EFFECTING ORGANIC CONTAMINANT REDUCTION CAPABILITIES
PRODUCT FILE NUMBER 20090132
TABLE 4 OF 4

Service Flow Rate: RO30 = 136 liters per day (lpd) [36 gallons per day (gpd)]
RO50 = 189 lpd [50 gpd]

Capacity*: 3,785 liters (l) [1,000 gallons (gals.)]

Tested Contaminant*	Influent Challenge (µg/l)[1]
Alachlor	50
Atrazine	100
Benzene	81
Carbofuran	190

HEALTH EFFECTING ORGANIC CONTAMINANT REDUCTION CAPABILITIES
PRODUCT FILE NUMBER 20090132
TABLE 4 OF 4 (continued)

Product Water Production Rate: RO30 = 136 liters per day (lpd) [36 gallons per day (gpd)]
RO50 = 189 lpd [50 gpd]

Tested Contaminant*	Influent Challenge (µg/l)[1]
Carbon tetrachloride	78
Chlorobenzene	77
Chloropicrin	15
2,4-D	110
Dibromochloropropane (DBCP)	52
o-Dichlorobenzene	80
p-Dichlorobenzene	40
1,2-Dichloroethane	88
1,1-Dichloroethylene	83
cis-1,2-Dichloroethylene	170
trans-1,2-Dichloroethylene	86
1,2-Dichloropropane	80
cis-1,3-Dichloropropylene	79
Dinoseb	170
Endrin	53
Ethylbenzene	88
Ethylene dibromide (EDB)	44
Haloacetonitriles (HAN):	-
Bromochloroacetonitrile	22
Dibromoacetonitrile	24
Dichloroacetonitrile	9.6
Trichloroacetonitrile	15
Haloketones (HK):	-
1,1-Dichloro-2-propanone	7.2
1,1,1-Trichloro-2-propanone	8.2
Heptachlor (H-34, HEPTOX)	80
Heptachlor epoxide	10.7
Hexachlorobutadiene	44
Hexachlorocyclopentadiene	60
Lindane	55
Methoxychlor	50
Methyl *tert*-butyl ether‡	15 ± 20%‡
Pentachlorophenol	96
Simazine	120
Styrene	150
1,1,2,2-Tetrachloroethane	81
Tetrachloroethylene	81
Toluene	78
2,4,5-TP (silvex)	270
Tribromoacetic acid	42
1,2,4-Trichlorobenzene	160
1,1,1-Trichloroethane	84
1,1,2-Trichloroethane	150
Trichloroethylene	180
Trihalomethanes **(chloroform surrogate)**	300
Xylenes (total)	70

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Other Conditions: the contaminant reduction performance capabilities displayed for Table 4 of 4 were verified by testing conducted in accordance with NSF *International* Standard 53. To qualify for the reduction of the organic contaminants listed above, the device must reduce the influent challenge concentration of chloroform at 300 µg/L ± 10% at each sample point by a minimum of 95%. To qualify for the reduction of MtBE, the device must reduce the influent challenge concentrations such that all effluent concentrations are ≤ 5.0 µg/l.

1 = micrograms per liter (µg/l) are equivalent to parts per billion (ppb) **±** = plus or minus
≤ = less than or equal to **‡** = tested independently of the chloroform surrogate
***** = all contaminant reduction claims in Table 4 of 4 are based on the tested capabilities of the "Total Defense" (i.e. "TD") cartridge

This device was tested under controlled laboratory, or field, conditions. The actual performance of this device for a specific end use installation will vary from the tested conditions based on local factors such as water pressure, water temperature and water chemistry.

The department is in no way endorsing this product or any advertising, and is not responsible for any situation which may result from its use.

Sincerely,

Glen W. Schlueter
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Safety and Buildings Division
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